

By 1790, Charleston's population reached 16,000, making it the fourth largest city in America and the unchallenged commercial center of the lower South. The eventual removal of British trade restrictions stimulated unprecedented commercial activity between foreign markets and Charleston. In addition, the nearly continuous state of warfare in Europe from 1793 to 1815 caused a large expansion in the American shipping industry, despite high risks and severe losses.

Efficient water transportation was the cornerstone of Charleston's rapidly expanding position as an agricultural center and port. During the nineteenth century, as in the eighteenth century, there was an abundance of boat and vessel types in Charleston and the surrounding area. Vessel type usually depended upon expected use and environment. Small inland boats, such as skiffs, canoes and batteaus were well suited for use in shallow creeks and streams as well as rivers. Those small craft enabled communication and transportation along the waterways. In 1861 Edmund Ruffin, while traveling through the lowcountry, noted the construction of the ubiquitous flat boat. Ruffin stated:

Col. Lartigue's carpenters began this morning to build a flat boat (or bateau) which is to be ready tomorrow to convey him & others to an island in the river for a week's hunting. As may be supposed, the building of such a boat is a slight affair, & it rarely is kept for another such use (Matthew 1992:139).

While traveling along the Big Salkehatchie River, Ruffin also described the construction of "canoes," or "sea boats." These vessels, constructed from cypress logs, were used to carry passengers and cargo in the lowcountry. Ruffin noted,

I saw collected at the bridge several of the enourmous [sic] canoes, each dug entire out of the trunk of a single cypress tree, & which are carried in a rough state to the lower country to be completed. These rough canoes are sawed in two lengthwise, & a central bottom or keel part from another tree used to widen or deepen the vessel. The three parts are secured by inside cross timbers, & the whole dressed over; & thus are made the excellent and beautiful sea boats, still termed canoes, common in Edisto Island which 10 rowers may work to advantage & as many passengers be safely conveyed (Matthew 1992:142).

As cotton production increased, planters utilized vessels known as "cotton boxes," or "box boats," to carry bulky cotton cargoes down river. These vessels, some as large as 60 feet long and 25 feet wide, were cheaply constructed and designed for a one-way trip down river. Typically, upon reaching their destination, these boats were broken up and the lumber sold

(Fleetwood 1982:87). All types of vessels, large and small, played an important role in the region's transportation and economic systems. Consequently, shipping contributed heavily to Charleston's rise as a valuable commercial center and port during the early nineteenth century.

During the early 1800s, Charleston became a depot for European goods bound for the West Indies, as well as West Indian produce destined for Europe. Favorable prevailing winds and ocean currents enabled ships to sail from Charleston to the European continent or Great Britain as quickly as ships from New York or Boston. Even the undeclared war with France at the end of the eighteenth century had little effect on Charleston's trade. Tonnage entering and leaving the port totaled 35,709 in 1796, and climbed to nearly 49,000 tons at the beginning of the nineteenth century. Tonnage continued to gradually increase, reaching a peak in 1808 of 53,011 tons; this in spite of Jefferson's Embargo Act in 1807 (American State Papers: Commerce and Navigation Vol. VII, *passim*).

Charleston's burgeoning maritime activities were temporarily interrupted by war with Great Britain in 1812. Tonnage which averaged more than 50,000 in the years preceding the conflict dropped to 27,506 in 1812 and 29,477 the following year (American State Papers: Commerce and Navigation Vol. VII, *passim*). Although the British used warships before the hostilities to patrol the South Carolina coast, they were generally too few to seriously affect shipping. In the fall of 1812 an intensified British blockade began to stifle trade in the port. In October the commanding officer of the Charleston naval station reported that the port was blockaded by four warships (Dudley 1986:534-535). From that time, until the end of the war, the British maintained at least one warship off Charleston at all times. British vessels entered the inlets and river mouths, looting plantations, capturing vessels, and completely disrupting coastwise trade (Wallace 1951:368-369). Under such circumstances commercial river transportation became riskier.

To defend Charleston, the United States Navy utilized the brig *Vixen* and several small gunboats (Dudley 1986:60, 101-102). In addition, privateers occasionally slipped out of the port to prey on British shipping in the West Indies. Although privateering was effective in capturing or destroying West Indian shipping, it had little effect on the blockade. The city's economy and maritime traffic suffered until the Treaty of Ghent in December 1814.

The end of Charleston's cotton boom years, from 1795 to 1819, brought harsh economic reality to many merchants and planters. An 1819 national economic depression effectively ended Charleston's commercial expansion. Few merchants survived the tough economic times of the 1820s (Greb 1978:18, 27). Although the economy quickly stabilized following the depression, the city entered into a lengthy economic decline.

Another factor in Charleston's economic decline was cotton production in the American southwest. As more cotton was produced outside the region, Charleston's port declined in relative importance. As early as 1812, South Carolina's cotton production was beginning to show signs of decline. In that year South Carolina's production, approximately 50 million pounds, totaled only 28 percent of the American total of 177 million pounds (Smith 1958:7). Throughout the 1820s, Charleston's domestic and foreign commerce declined. In 1815, Charleston owned 15,619 registered and 10,578 enrolled tons. By 1829, the aggregate tonnage declined to less than 7,000 tons, a decrease of seventy five percent (Hutchins 1941:243).

By 1828, Charleston's exports dropped to approximately \$7,000,000, far less than before the war. In the same year a member of the city council noted that "Charleston...has for several years retrograded with a rapidity unprecedented. Her landed estate has, within eight years, depreciated in value one-half. Industry and business talent driven by necessity, have sought employment elsewhere. Many of her houses are tenantless, and the grass grows uninterrupted in some of the chief business streets" (Wallace 1951:448-449). Although Charleston's 1820 population of 20,000 ranked sixth in the nation, the city grew little in the following half century. As a result of economic distress, the city dropped rapidly from the nation's most populated cities (Goldfield 1982:31).

New York City's enormous expansion of coastal trade was an important element in Charleston's decline as a port. New York shippers, for example, captured Charleston's cotton-carrying trade by developing what was known as the "cotton triangle," a system whereby New York vessels picked up cotton from the port docks of South Carolina and other southern states, carried it to Liverpool, brought European cargoes back to New York, and distributed the imports to the southern ports (Green 1957:22). Rice, along with cotton, declined as an export commodity throughout the 1815 to 1860 period. Charleston steadily lost its commercial strength to New York, and to the emerging Gulf ports, particularly New Orleans.

Charleston's residents, acutely aware of mounting economic problems, made several attempts to improve regional transportation systems and regain economic momentum. In 1829, construction began on a railroad from Charleston to the Savannah River. The Charleston and Hamburg, more than a hundred miles in length, was completed in 1833. Although there was a slight increase in Charleston's inland trade during the 1830s, it appears that the railroad did not contribute significantly (Smith 1958:160). In the following years other railroads were completed, but Charleston's economy remained tenuous.

In order to regain direct trade with foreign ports, a deeper harbor was required. By the 1840s, the harbor and approach channels needed at least a 16 to 17 foot depth in order to accommodate vessels engaged in foreign trade. In 1851 the city, in cooperation with the U.S. Army Corps of Engineers, attempted to deepen the harbor. A hydraulic dredge was constructed and work began. Although moderate success was achieved, the secession crisis and war halted the project (Moore 1981:15-19). It was not until after the Civil War that the main channel was dredged to a uniform 16 to 17 foot depth, but by that time the depth was inadequate.

By the middle of the nineteenth century, Charleston had developed into a banking and manufacturing center, which provided liquid assets necessary to stimulate trade. Successful banks were chartered in the 1830s. Manufacturing was even more successful. In 1850, the city ranked third in the South behind Richmond and New Orleans (Lander 1960:330-351). During the 1850s trade in Charleston began to grow once more (Eaton 1961:241). The combined value of the port's imports and exports increased from \$13,381,585 in 1850 to \$22,764,907 in 1860, an increase of more than seventy-one percent (Van Deusen 1928:259-260). Unfortunately, the turmoil associated with secession undermined the city's mid-century economic gains.

Civil War

Charleston was a focal point of the social, economic, and political pressures that erupted into civil war following secession. On 20 December 1860, the Convention of the People of South Carolina issued the statement that, "The Union now subsisting between South Carolina and other States, under the name of the 'United States of America' is hereby dissolved." On 15 April 1861, newly organized Confederate forces under the command of P. G. T. Beauregard attacked the U. S. garrison at Fort Sumter and shelled the fortification into surrender. President Abraham Lincoln promptly declared that a state of open rebellion existed and called for volunteers to preserve the Union. Lincoln also issued a proclamation on 19 April 1861 that confirmed a blockade of southern ports.

President Lincoln's proclamation calling for a blockade of the Confederacy, was viewed as a "paper blockade," because the Federal government did not possess sufficient vessels to carry out such a blockade. The arrival off Charleston of the frigate *Niagara* on 11 May did nothing to halt the passage of blockade runners through Charleston harbor (*Charleston Courier* 13 May 1861). However, the attack and seizure of Port Royal late that year, which gave Union forces possession of one of the best small harbors on the east coast, left no doubt that war was indeed underway. The capture of Port Royal gave Union naval forces a port wherein blockading vessels could be supplied,

repaired, and fueled. It also gave Union naval forces control of the coast from above Georgetown, South Carolina, to New Smyrna, Florida, with the exception of Charleston (Hayes 1961:365).

General Robert E. Lee had been given command of the Confederate troops in South Carolina and was authorized to "use all the resources of South Carolina and Georgia" in order to protect Charleston from the attack that was now certainly imminent. Lee ordered that the inland passes to Charleston be closed and a harbor defense prepared (Freeman 1934:622-623). It was essential that the Charleston and Savannah Railroad be kept operational, thereby permitting the movement of troops from either Savannah or Charleston to the threatened point. The railroad was the lifeline of Lee's coastal defenses. Had a sudden attack on the mainland captured the railroad, the results would have been disastrous for Lee and the Confederacy.

The arrival of additional blockading vessels off the Charleston bar did little to effectively close the harbor. However, in December 1861 sixteen vessels loaded with granite and designated as the "Stone Fleet" arrived off Charleston. The vessels, mostly old whaling ships, were sunk checkerboard fashion across the mouth of the main channel leading to Charleston in an effort to increase the effectiveness of the blockade. An editorial in the *New York Herald* stated, "Charleston, so far as any commerce is concerned except that in small coastwise vessels, may be considered 'up country'" (USONWR XII:421-422). The next day the *Charleston Mercury* carried an article that read in part, "On the occurrence of the first heavy northeaster, after the sinking of the wrecks, the force of the wind, the heave of the sea and the action of quicksands, will according to all previous experiences dissipate the Yankee obstruction" (*Charleston Mercury* 21 December 1861).

In spite of the questionable effectiveness of the blockade, blockade running was not without tremendous risk. More than a dozen vessels were destroyed in the process of attempting to run into or out of Charleston during the war. Many like the *Flora*, *Flamingo*, and *Presto* were fast steamers purchased or constructed to run the blockade. Despite the blockade the channel remained open, particularly to blockade runners who continued to flout the Union warships. By 1863, Charleston had become the South's major blockade running port. Private companies used the South Carolina port while the Confederate government concentrated its blockade running activities at Wilmington. Between 1 January and 30 June 1863, some 40 steamers entered the harbor and another 32 cleared, taking with them more than 29,000 bales of cotton. During 1863 only 11 ships were lost out of 168 attempts by steam blockade runners to clear Wilmington and Charleston (Wise 1983:223, 254-257). Charleston so dominated early blockade running that the American consul wrote from Liverpool that its capture would be regarded "as the deathblow to the rebellion, and do more than discourage those who are aiding them with supplies and money than any other thing."

Following the defeat of Union troops in the Battle of Secessionville, General Beauregard was assigned to command the Department of South Carolina and Georgia. He assumed this command in September 1862 and immediately began the task of strengthening Charleston's defenses. Modifications were made in both Forts Sumter and Moultrie and additional heavy guns were requested to facilitate control of the harbor. The Confederate Navy also contributed to the city's defenses. After the battle between the *Monitor* and *Virginia* in Hampton Roads, the Confederacy contracted for a large number of armored ships to defend its harbors. Two, the *Chicora* and *Palmetto State*, were built in Charleston and joined the city's defense in October 1862. This naval force would be bolstered with the addition of the ironclads *Columbia* and *Charleston* in early 1864 (Still 1971:79-87, 91, 112). By 1863, the port had an impressive network of defenses including forts, minefields, and warships.

On 30 January 1863 the *Palmetto State* and *Chicora* crossed the bar and attacked the Union blockaders. After a confusing night engagement in which two Union Warships surrendered, but were not taken, the Confederate vessels steamed back under the protection of the city's fortifications. Although the blockade was not "raised," Flag Officer Francis DuPont, in command of the South Atlantic Blockading Squadron, urged that reinforcements be sent (DuPont 1969:416). DuPont was ordered to attack the city after receiving reinforcements which included a powerful force of ironclads.

DuPont's fleet arrived off the Charleston bar on 5 April 1863. Two days later, in line of battle, the fleet steamed slowly toward the harbor. As the entire channel was carefully buoyed so that the gunners on Fort Sumter, Morris Island, and Sullivans Island would know the exact range of the attacking vessel, the Federal fleet came under a barrage of heavy and extremely accurate fire. Nearly all of the attacking Union vessels were damaged and many were disabled during the action. The double-turreted ironclad *Keokuk* steamed within 900 yards of Fort Sumter where its guns were incapacitated and the hull and turrets riddled. The vessel was able to move away but sank the next morning off Morris Island (USONWR XIV:23).

The Confederate victory was short lived. DuPont's warships quickly returned, and blockade running declined. From July until September 1863, only four vessels entered and cleared Charleston, and from September until March 1864, no runners steamed in or out (Wise 1983:257-258). Wilmington replaced Charleston as the center of Confederate blockade running. Nevertheless, up to the war's end, blockade runners occasionally slipped in or out of the harbor.

In July 1863, Federal forces launched an assault designed to gain control of Morris Island. The assault was supported by Federal vessels. Faced with overwhelming fire power, the Confederate forces on the island were forced to

withdraw. Realizing that control of Morris Island alone would not provide access to Charleston, General Gillmore, commander of Federal forces on the island, ordered construction of several batteries that would house his heaviest artillery for battering down the walls of Fort Sumter. In anticipation of a bombardment, Beauregard ordered the casements and other areas of Sumter be filled in with wet sand and bales of cotton soaked in salt water. A new sallyport and wharf were constructed west of the city side of the fort (Johnson 1890:180-189). Union forces, with the support of the monitors *Passaic* and *Patapsco* began shelling Fort Sumter on 17 August. Although the firing abated somewhat at dusk, Union forces shelled the fort for most of the night. Upon inspecting Fort Sumter after the first day's shelling, the fort's commanding officer found that seven guns were disabled and the masonry had been damaged extensively (USONWR XIV:453).

The next several days progressed in the same manner, with damage to Sumter becoming more and more apparent. During the lull in fighting that followed an abortive attempt by Federal forces to storm Forts Sumter and Wagner, efforts were made to strengthen the harbor defenses (Figure 5). Early in October, the Confederate Ram *David*, under the cover of darkness, left Charleston Harbor and rammed its spar torpedo into the side of the Federal vessel *New Ironsides*. This effort nearly swamped the *David* and did not inflict serious damage on the Federal ship. For months, the daily bombardment of Fort Sumter and Charleston continued. The constant shelling, coupled with damage from the fires that broke out almost daily, caused the Northern press to state that "block by block of that city is being reduced to ashes,..." (Burton 1970:257-259). In addition, the blockade of Charleston had been steadily tightening.

In an effort to inflict damage on the Federal fleet, Confederate commanders decided to employ the submarine *Hunley*. Late in December 1863, the *Hunley* had been ordered to the vicinity of Charleston Harbor. On the night of 17 February 1864, the vessel moved through the channel of Breach Inlet toward the open sea and the Federal blockading vessel *Housatonic*. The night was clear and calm and the *Hunley* was sighted within 100 yards of the *Housatonic*. However, the rapid approach of the submarine prevented the crew of the Federal vessel from bringing any large guns to bear and the *Hunley* seemed impervious to the small arms fire with which it was met. The *Hunley* rammed its spar torpedo into the vessel, blowing away the after part of the ship and caused it to sink immediately in twenty-seven feet of water. The *Hunley* did not return to station and was assumed lost as a result of the action against the *Housatonic* (USONWR XXXV:112-113).

By the end of May 1864, there were 21 Federal vessels anchored at the mouth of Charleston harbor and 24 others anchored in nearby inlets. On the morning of 2 July 1864, Union forces landed approximately 2,500 men on the southern end of James Island under the protection of heavy fire from two

GENERAL MAP OF CHARLESTON HARBOR SOUTH CAROLINA

Showing Rebel Defences and Obstructions

Shore Line, channels, fortifications & armaments
are from surveys and data of U.S. Coast Survey

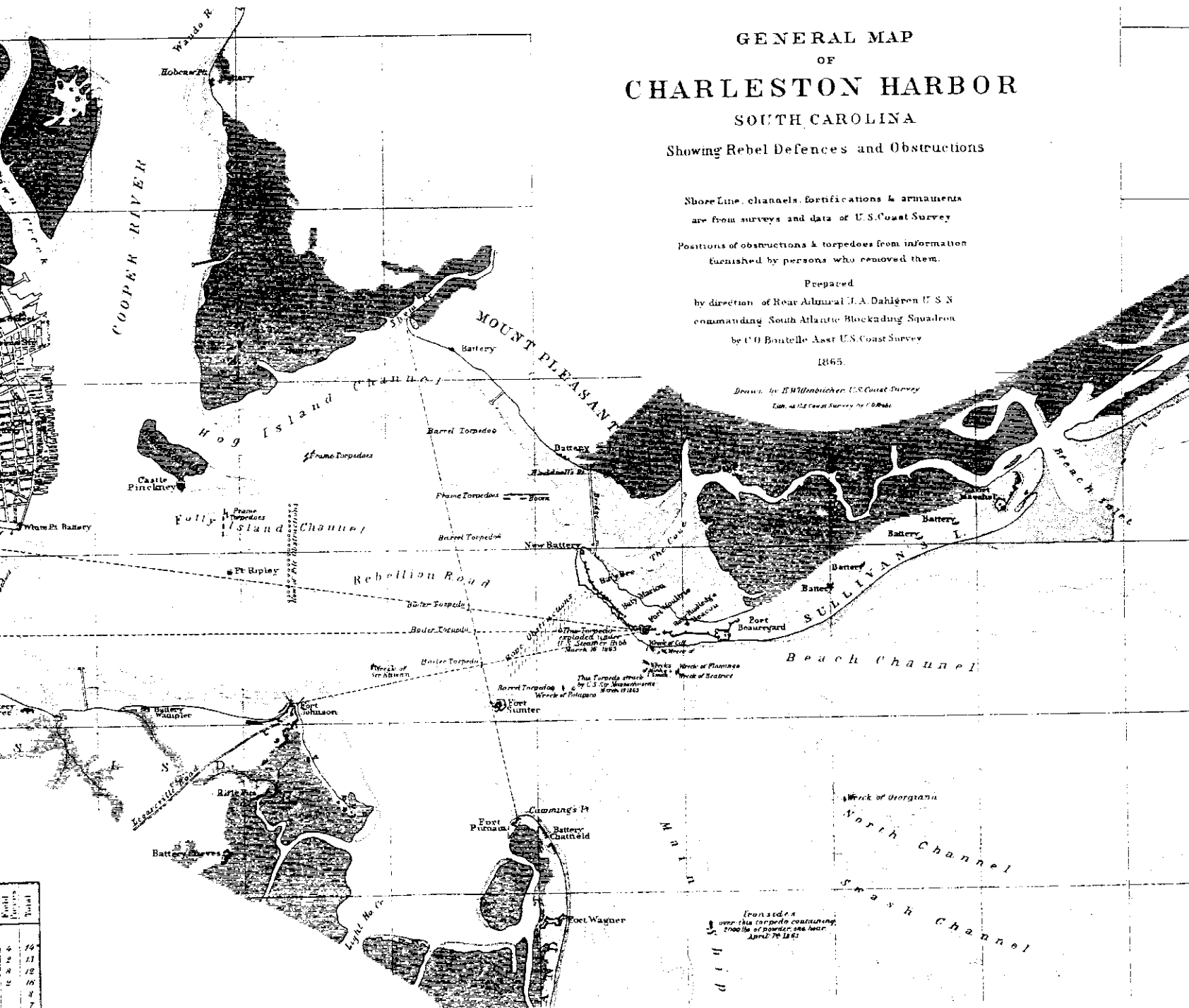
Positions of obstructions & torpedoes from information
furnished by persons who removed them.

Prepared

by direction of Rear Admiral J.A. Dahlgren U.S.N.
commanding South Atlantic Blockading Squadron
by C.D. Bontelle Asst. U.S. Coast Survey

1865.

Drawn by E.W. Mendenhall U.S. Coast Survey
Engr. by U.S. Coast Survey by C.D. Bontelle



Field	Fort	Total
4	74	
2	11	
8	12	
2	16	
8	7	

Iron adena
over this torpedo containing
200 lbs of powder, and here
April 29 1865

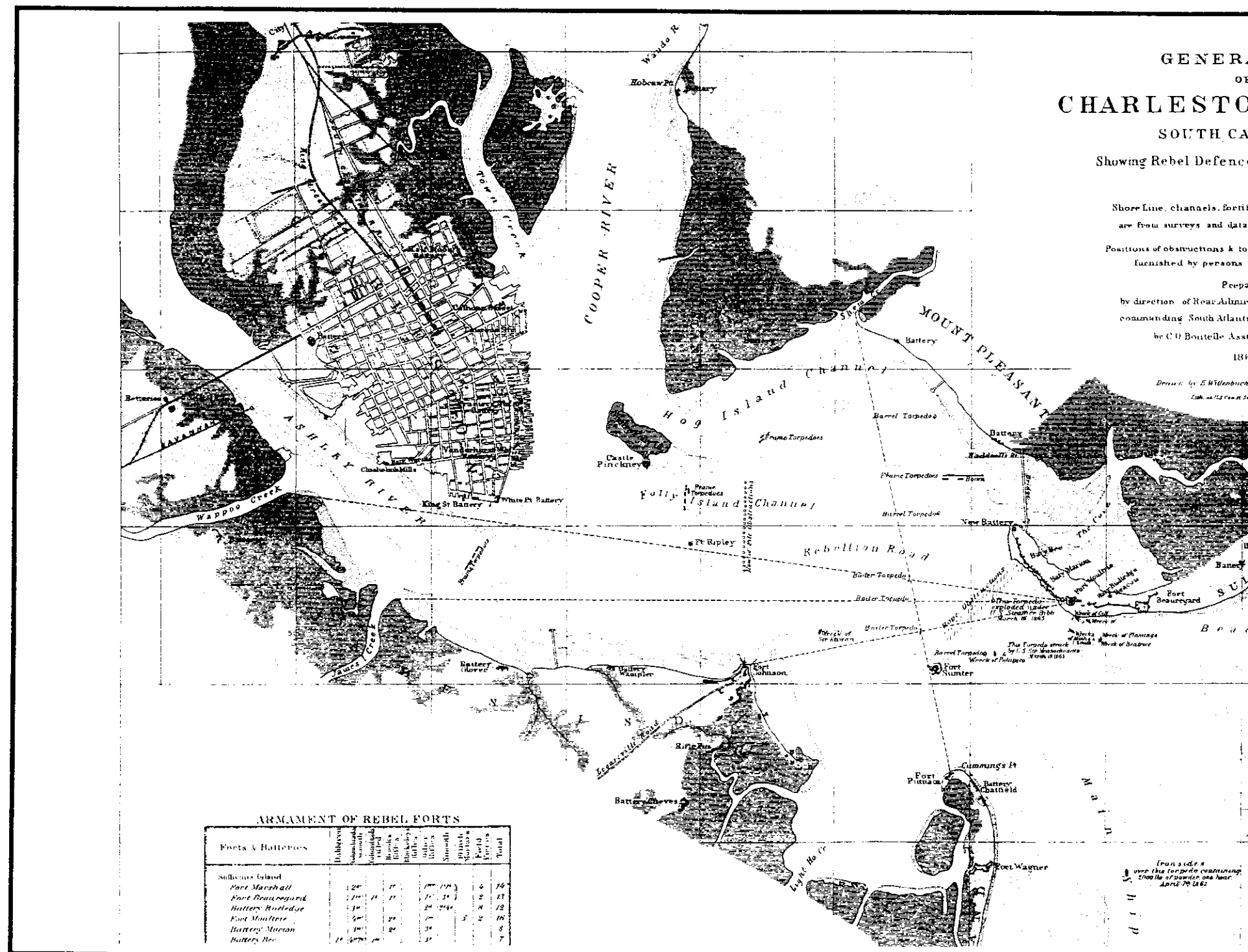


Figure 5. General Map of Charleston, (U.S. Coast Survey, 1865).

monitors and several gunboats. A simultaneous amphibious assault on Fort Johnson ended in failure. During the next two days, skirmishes took place along the Confederate lines across the island, supported by a heavy bombardment from Union batteries on Morris Island and the fleet (USDW XXXV:160). While this and other skirmishes occurred, Fort Sumter and Charleston received severe bombardments which would continue day and night through the first week in September. However, the bombardment dwindled to almost nothing by October. After two and one-half years of relatively steady bombardment, with some of the heaviest guns then employed, Fort Sumter was still impregnable (Burton 1970:308-311).

In renewing the attack on the city, Federal picket boats and at times monitors were sent in to test the obstructions in Charleston harbor. The monitor *Patapsco* struck a mine while searching for obstructions the night of 15 January 1865, and sank in less than a minute. The vessel went down approximately 800 yards off Sumter with only the top of the stack showing above water (Dahlgren 1882:492).

At the end of January, the garrison at Fort Sumter consisted of approximately 300 men. The fort's three guns still commanded the entrance to Charleston Harbor and these, in conjunction with the guns on Sullivan's Island and the mines in the harbor, made it extremely dangerous for any vessel to enter. On 10 February, Federal troops again landed on James Island, aided by the heavy fire of the monitors *Lehigh* and *Wissahickon*. At the same time the gunboat opened fire on Secessionville. In mid-February, 18 Federal vessels were sighted off the Charleston bar, 13 of which moved to Bulls Bay to attempt troop landings. The Federal batteries on Morris Island increased their rate of fire on the city, and on 14 February, General Beauregard made the decision to evacuate the city. The evacuation took place on the nights of 17-18 February with troops coming in from the outlying positions as well as from Fort Sumter. The ironclads guarding the harbor were destroyed by retreating Confederate forces to prevent them from falling into Union hands. Upon his entrance into the city, General Gillmore, of the Union Army, noted, "The city itself is little better than a deserted ruin" (USDW XLIV:473-521).

Post Civil War Period

For Charleston, the Civil War proved disastrous. The local economy collapsed during the war. Before economic prosperity returned the city had to rebuild. Charleston would slowly revive partly due to an influx of northern capital. Although commercial vessels entered the port almost immediately after the war's conclusion, normal oceanic trade could not resume until sunken warships and obstructions were removed from the channels. This would not begin until more than five years after the war ended, when Colonel Quincy A. Gillmore, who ironically had played a major role in the

Union bombardment of Charleston, was appointed supervising engineer for river and harbor improvements in the Cape Fear to St. Augustine area. An engineer office was established in Charleston in 1871. As Professor Moore wrote in his history of the Charleston District of the Corps of Engineers, "the devastation of the Civil War made a partnership with the Federal government an absolute necessity for Charleston" (Moore 1981:109).

Throughout his long career Colonel Gillmore was partial to Charleston. He was convinced that the city could become a thriving port again. He was also convinced that extensive harbor improvements would play a major role in achieving that economic revival. His opportunity came in 1877 when southern and midwestern members of Congress aligned together to obtain federal funds for river and harbor improvements. That alliance continued for many years and provided funds for substantial and continuous improvement to Charleston and other southern ports (Moore 1981:32-33).

Gillmore developed a plan for dredging and maintaining a 21 foot channel in Charleston harbor. His plan included using jetties to help natural scouring create the required depth. Gillmore anticipated that once the desired depth had been achieved, the power of the ebb tide would maintain it (Moore 1981:33-35). Between 1878 and 1895 Gilmore's plan was put into effect (Figure 6). Although a channel of depth of only of 17 1/2 feet was achieved, it was considered a success. As Professor Moore wrote, "Charleston at last had a modern harbor, one which could admit the largest vessels afloat. Physically at least, the city was in a position to regain commercial prominence" (Moore 1981, See also Annual Report of the Chief of Engineers 1879:731-738 for Gilmore's plan; and annual reports until 1896 for progress reports).

The port's commerce, of course, had not been dormant during these years. Although it would not reach its pre-war level and prosperity for many years, Charleston's commerce nevertheless recovered rapidly. In 1870, there were two lines of steamers to New York, one each to Baltimore, Philadelphia, and Liverpool, and steamboat connections with Savannah, Beaufort, and Georgetown (Simkins 1966:282). In 1870, exports totaled \$10,772,071 and imports \$505,609, less than half the 1860 total. Charleston's export trade did not recover its pre-war level until the mid-1870s. Whereas, the import trade remained stagnant until the twentieth century (Moore 1981:157).

By 1880, the city's population reached 50,000, thereby doubling in thirty years. During that period, Charleston's ocean-borne trade continued to climb, averaging more than \$20.1 million in exports by 1883. The city's wharves could handle more than 200 ships of all sizes. Cotton, rice, and phosphate were the principle exports. Charleston had still not recovered entirely from

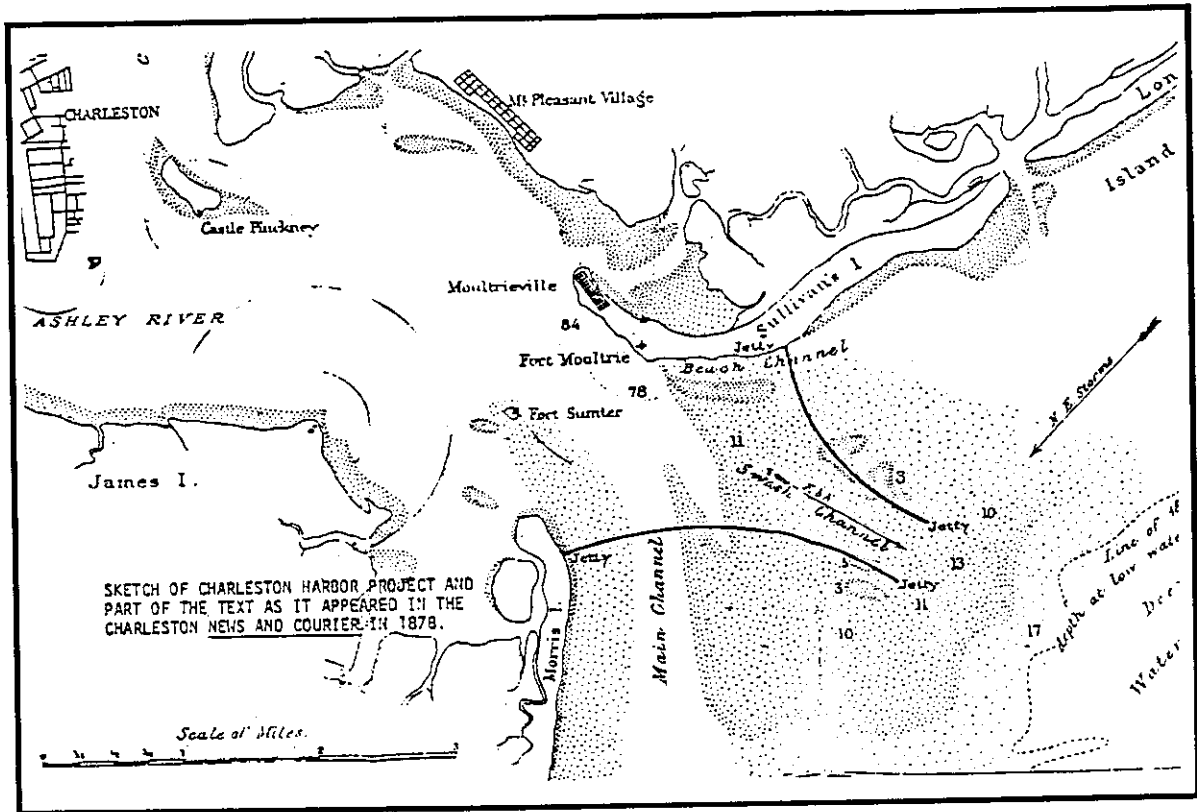


Figure 6. Sketch of the Charleston Harbor Project, 1878.

the effects of the Civil War. It had been a manufacturing center in the 1850s, but industry in the city nearly disappeared during the war years. The city would not re-develop a substantial industrial base until the twentieth century.

Ports depended upon an inland transportation system. Railroads began replacing steamboats in importance in the United States during the latter half of the century. During the first decade after the Civil War, railroad mileage in this country more than doubled. The important rail link with Savannah was destroyed during the war by General Sherman's troops and was not operational again until 1870. More importantly the expansion of railroads connecting interior towns with the sea coast seriously affected Charleston's economic future. Railroads would determine trade routes and urban growth. Because of railroad expansion, Norfolk by the mid-seventies had surpassed both Charleston and Savannah, and was third behind New Orleans and Galveston in cotton exports (Brownell and Goldfield 1977:95-96). Also, more and more cotton products moved out of the South by rail. By 1892, Charleston was receiving only 5.67 percent of the nation's cotton crop for export, less than half its 1870 percent. The city's export trade for the 1900 to 1909 period was less than a fourth of the value of the 1885 to 1894 trade (Moore 1981:169).

Twentieth Century

Although the Corps of Engineers worked to create a modern harbor in Charleston, the city's trade continued to decline. The U.S. Navy's decision to locate a naval base at Charleston provided the city with an economic boost and further justification for large expenditures regarding harbor improvements. Although the Union used the captured harbor at Port Royal as an operating base for the South Atlantic blockading squadron, it was not until 1889 that a Navy commission recommended that a new Navy base be built at Port Royal. This new facility would serve the central-southern portion of the United States. A wooden dry dock, which was to act as the corner stone of the new facilities, was begun in 1891, but never satisfactorily completed. Furthermore, the decision to switch from wooden to stone dry docks was made shortly thereafter and rendered this structure obsolete. In 1899, Major Adger Smyth and South Carolina Senator Benjamin Ryan Tillman started a campaign to move the Navy Yard to Charleston. The following year a board of Navy officers under the auspices of the Navy Secretary decided that the Naval Station should be moved to Chicora Park, Charleston (Moore 1981:58-60; Simkins 1966:365-367, 524-527).

To attract the Navy Yard, the City of Charleston arranged for the purchase of land from Chicora Park to Shipyard Creek. Some 760 acres of this area was marshland and was sold to the Navy for the princely sum of one dollar while the remainder was priced at \$84,307. On 12 August 1901 the Navy assumed possession of the property. In March 1907, the navy constructed a 583 foot by 97 foot stone dry dock at the Charleston shipyard. Additionally, during the First World War the U.S. Navy built eight wooden hulled submarine chasers, a gunboat and partially completed a destroyer at the Charleston Navy Yard. At its peak, the yard employed 5,600 people.

Despite a lull in the yard's post World War I activities, an influx of post-depression monies allowed the U. S. Navy to develop the yard into a first class facility by the beginning of World War II. Between those wars, the navy constructed a new dry dock and a second shipyard. In addition, during the post World War II era, the shipyard became a submarine overhaul yard, as well as a nuclear shipyard, in 1956 (McNeil 1985:146). Beginning in 1948, the Navy utilized the Charleston Navy Yard for submarine overhauls and surface ship repairs. In addition, naval yard expansion facilitated the development of the North Charleston area.

The port's tonnage varied between six and eight hundred thousand tons during the pre-World War I years. The value of this trade, however, declined from over 100 million in 1910, to less than half that amount in 1914 (Wallace 1951:652). Although World War I reduced the city's transoceanic trade, the return of peace it revived again. During the twenties commerce averaged

slightly under 2.5 million tons. The coming of the Depression affected Charleston as it did other ports throughout the country. Between 1931 and 1941 the port lost 16 percent of its tonnage.

World War II ended this decline, and Charleston, with its large naval base and shipping facilities, boomed economically during the war. As in World War I, the government built massive water transportation centers. Moreover, in 1947, the government transferred these facilities to the city, which, consequently, conveyed them to the State Port Authority (Pender and Wilder 1974:6). As a port, Charleston prospered during the post-World War II years. By 1949, the city's shipping averaged 5,000,000 tons and Charleston once again became the most important southeastern seaport (Sass 1949:62).

Improvements to Navigation in Charleston Harbor_____

Antebellum Period

Before 1850, the flow of ebb and flood tides effectively scoured ship channels through the harbor bar. Conversely, during the 1850s the channels began to fill with sand, as well as migrate. Consequently, the dynamic nature of those important shipping channels forced Charlestonians to begin a short lived system of channel maintenance by dredging (Moore 1981:20). In 1856, using a prototype dredge, later known as the *General Moultrie*, James M. and Thomas D. Eason removed an extension of Drunken Dick Shoal. Other channel maintenance activities followed the successful 1856 project, but, due to the onset of the Civil War, channel maintenance abruptly ended (Moore 1981:20).

Wreck and Obstruction Removal

Attempts to clear the wrecks and obstruction from Charleston Harbor did not begin until the early 1870s. In 1871 work was initiated to remove several Civil War wrecks within Charleston Harbor, including: the ironclad *Palmetto State*, near the mouth of Town Creek; the ironclads *Charleston* and *Chicora*, in the Cooper River off Marshall's Wharf; the *Patapsco*, sunk in the channel near Fort Sumter; the *Beatrice* and two wrecks, near the inner mouth of Beach Channel; the *Housatonic*, sunk outside the main bar in 4 1/2 fathoms; the *Weehawken*, in the main channel abreast of Morris Island; and the *Keokuk*, near the south end of Morris Island. Also, obstructions made from a torpedo boat and dry dock in Town Creek were also noted for removal. Between 1871 and 1879, 14 ironclads and wooden vessels were removed from Charleston's waters (U. S. Army Corps of Engineers 1871:69; 1872:64-65; 1879:95). These, however, were not the only wrecks removed during Charleston's modernization efforts.

In 1890, Mr. K. S. Tupper contracted to remove a consolidated mass of old guns, chain, bar shot, and other cemented ordnance from an unknown wreck in the south channel on Charleston Bar. The material was removed to provide a channel of 12 1/2 feet below low mean water (U. S. Army Corps of Engineers 1890:1233).

Three wrecks were removed from the upper reaches of the Cooper River in 1893. The tug *B. F. Huger* was reported in the Eastern Branch of the Cooper River and was removed by Mr. Hasell W. Crouch. The other two wrecks, a sloop and a schooner, were located on Quinby Creek, a tributary of the Eastern Branch of the Cooper River. Both wrecks were also removed by Mr. Crouch. The schooner was deposited on the marsh on the north side of Quinby Creek, with a pile driven through its bottom to prevent it from drifting back into the creek. The sloop was broken up and its remains piled above the high water mark (U. S. Army Corps of Engineers 1893:1531).

In 1894 Messrs. Charles W. Johnson and Enoch Townsend were contracted to remove the wreck of the schooner *Kate V. Aiken* from the Swash Channel (U. S. Army Corps of Engineers 1894:174). Only a portion of the wreck was removed by the contractors and after a failure to remove the rest of the wreck the contract was annulled. The remaining portions of the wreck were finally removed by the Merritt & Chapman and Wrecking Company in 1906 (U. S. Army Corps of Engineers 1906:292).

In 1895, contractors, repairing the Ashley River Bridge, removed the mast of a sunken sloop, then lying submerged in 30 feet of water underneath the bridge (U. S. Army Corps of Engineers 1895:1446). In 1899, B. F. Kramer removed the wreck of the tug *Douglass*. The tug sank in the Ashley River at the draw of the Charleston and Savannah Railroad Bridge. The iron-hulled vessel broke in half during removal. The boiler and broken parts of the hull were deposited near the bridge at the low water mark (U. S. Army Corps of Engineers 1899:1550).

In 1904, the *Agostino C*, a converted phosphate barge, was removed from the Ashley River near Lambs. The vessel was dynamited to provide a navigation channel of 14 feet over the wreck (U. S. Army Corps of Engineers 1905:1258). Several other wrecks were removed in 1908. The *Housatonic*, still a hazard to navigation, was dynamited and finally removed from the entrance to the harbor. The *Cambusdoon*, the hulk of an old bark found floating within the harbor, was deposited on Morris Island by the dredge *Winyah Bay* (U. S. Army Corps of Engineers 1908:332; 1090:316). In addition, the tug *Buck* was removed from the harbor, near the coal wharf, and deposited on Hog Island (U. S. Army Corps of Engineers 1910:378).

Charleston Harbor

Corps of Engineers improvement of the Charleston Harbor navigation channels began in 1874. One of the first projects called for removing a portion of Bowman's jetty, which projected into the Beach Channel, and dredging Beach Channel to a depth of 15 feet, all of which was completed in 1877 (U. S. Army Corps of Engineers 1874:4; 1877:67).

The first legislation to improve Charleston's harbor was the River and Harbor Act of 1878. This act provided for the construction of two jetties across the bar channel and auxiliary dredging to maintain a channel depth through the bar of 21 feet at mean low water (U. S. Army Corps of Engineers 1880:126). Work commenced on the north jetty in December 1878 and on the south jetty in 1880. This system of jetties was completed in 1895 (U. S. Army Corps of Engineers 1897:222). The north jetty extended 15,443 feet out from Sullivan's Island and the south 19,104 feet from Morris Island. At the work's completion, the mean low water channel depth was 17 1/2 feet. By 1898, maintenance dredging increased the channel depth to 20 feet below mean low water.

As part of the River and Harbor Act of 1880 three short spur jetties, 700 to 1,000 feet apart, were to be built between Fort Moultrie and the north jetty on Sullivan's Island to prevent beach erosion during the construction of the north jetty (U. S. Army Corps of Engineers 1880:127). However, later examination deemed that only one jetty was necessary, which was built in 1881.

Additional legislation required an increase in navigation channel depth through the harbor. For example, the River and Harbor Act of 1899 approved an increased channel depth and width at the entrance to Charleston Harbor. Specifically, the 1899 legislation called for a channel 26 feet deep and 500 feet wide (U. S. Army Corps of Engineers 1899:253). This project was modified in 1910. The 1910 Act authorized the enlargement of the entrance channel to 28 feet deep and 1,000 feet wide seaward of the jetties and 500 feet between them (U. S. Army Corps of Engineers 1910:375). The River and Harbor Act of 1917 also called for increasing the channel's depth, this time to 30 feet (U. S. Army Corps of Engineers 1917:642). In 1918, the project was modified yet again to provide for a navigation channel of 40 feet deep and 1,000 feet wide from the sea to the navy yard (U. S. Army Corps of Engineers 1919:714). By the end of 1919 a channel 30 feet deep and 600 feet wide, 1,000 feet wide at bends, extended from the deep water in the Cooper to the navy yard.

In 1927, further improvements increased the harbor's commercial capabilities. The River and Harbor Act of 1927 provided for a channel 30 feet deep and 1,000 feet wide from the sea to the inner end of the jetties. From the jetties the channel would maintain a 30 foot depth and 600 foot width to the

navy yard. Beyond the navy yard, a 40-foot channel depth would be maintained up to Goose Creek (U. S. Army Corps of Engineers 1927:610). Also, a 700-foot-wide turning basin was to be constructed at the port terminals, and a 30-foot-deep and 500-foot-wide channel was to be constructed through Town Creek (U. S. Army Corps of Engineers 1927:610). For national defense purposes, the 1927 Act allowed for the channel depth to be increased to 40 feet if necessary. By 1938, all work specified in the Act of 1927, was completed, except the Goose Creek extension. The 1927 Act established the harbor's basic configuration. All following acts either maintained or slightly modified the channel.

The River and Harbor Act of 1940 revised the 1927 Act to include a 35-foot-deep channel from the 35-foot contour in the Atlantic Ocean through Town Creek Channel up to the turning basin at the port terminals on the Cooper River (U. S. Army Corps of Engineers 1940:627). All 1927 widths remained consistent. On the east and north sides of Drum Island, a channel 30 feet deep and 600 feet wide was also maintained. In Shem Creek, beginning at the entrance from Hog Island, to and including a turning basin near the Mount Pleasant Wharf, a channel 10 feet deep and 110 feet wide was included (U. S. Army Corps of Engineers 1940:627). The turning basin was to be 130 feet wide and 400 feet long.

In 1941, the Chief of Engineers recommended a 30-foot-deep anchorage area between Castle Pinckney and Fort Moultrie (U. S. Army Corps of Engineers 1941:606). The 1945 River and Harbors Act included this recommendation. During the 1950s and 1960s the harbor's configuration was slightly modified. The River and Harbor Act of 1954, for instance, provided for deepening the 30-foot channel to 35 feet on the north and east sides of Drum Island (U. S. Army Corps of Engineers 1955:314). The 1960 Act provided for a 10-foot-deep, 90-foot-wide, and 1,150-foot-long channel in Shem Creek from the existing channel. Also, a 10-foot-deep and 90-foot-wide channel was to be maintained from Hog Island to the Atlantic Intracoastal Waterway connection at Shem Creek (U. S. Army Corps of Engineers 1960:377). By 1962, all new projects and modifications were completed.

In 1976, the Rivers and Harbor Act called for a Phase I Design Memorandum stage of Advance Engineering and Design. This design called for deepening the channel to 40 feet from the 42-foot contour to Goose Creek. It also called for the construction of one turning basin, modifications of existing turning basins, deepening and modifications of the anchorage basin, and deepening Shipyard River to 38 feet (U. S. Army Corps of Engineers 1977:7-3). The 1986 Water Resources Development Act restated the 1976 Act, but added a 35-foot channel to the Wando River, with the provision of a 40-foot channel if economically feasible (U. S. Army Corps of Engineers 1987:7-2).

Ashley River

The U.S. Army Corps of Engineers also made improvements to the Ashley River. The River and Harbor Act of 1880, for example, allocated money for dredging two shoals on the Ashley River. The first shoal was Accabee, located approximately 8 miles above Charleston. The second, below the Wando Phosphate Works, was 2 miles upstream of Accabee. The project provided for the establishment of a 10-foot-deep and 150-foot-wide navigation channel through the shoals (U. S. Army Corps of Engineers 1880:127). Dredging to the required depth was accomplished by 1886.

A 1912 Act approved dredging from the mouth of the Ashley River to Standard Wharf. This act provided for a navigation channel 20 feet deep and 240 feet wide (U. S. Army Corps of Engineers 1913:2010). This project was completed on 11 August 1913. In 1914 and 1915, shoaling necessitated redredging of this area. On 21 December 1916, the Chief of Engineers recommended that the 20-foot depth be increased to 24 feet. While this recommendation was not acted upon, the Corps of Engineers conducted routine maintenance dredging to reduce shoaling, primarily near the seaboard Air Line Railway trestle.

In 1936 the Chief of Engineers recommended that a 30-foot-deep and 300-foot-wide channel be maintained from the mouth of the river to the Standard Wharf. This recommendation also included a call for maintaining the channel to the municipal yacht basin at 12 feet deep and 100 feet wide (U. S. Army Corps of Engineers 1936:493). The River and Harbor Act of 1937 allocated funding for these recommendations.

Shipyard Creek

Dredging within Shipyard Creek was first proposed in the River and Harbor Act of 1912. This act called for dredging a 15-foot-deep and 100-foot-wide channel through the upper mouth of the creek into the Cooper River (U. S. Army Corps of Engineers 1913:2011). However, work did not begin until dredging operations on the Ashley River were completed. Consequently, the dredging of Shipyard Creek was completed on 2 September 1913.

The River and Harbor Act of 1925 called for further improvements within Shipyard Creek. This act approved a 1 1/6-mile-long, 18-foot-deep channel from deep water in the Cooper River. The projected width of the project was 100 feet, with increased widths for bends. The act also called for a 500-foot-long and 250-foot-wide turning basin of the same depth (U. S. Army Corps of Engineers 1925:579). Due to the lack of private support, the work was never

completed. The failure to dredge a suitable 18-foot deep channel from the mouth to the upper end of the Gulf Refining Co. wharf stopped work on the project.

New work for Shipyard Creek was recommended in the River and Harbor Act of 1930. This act provided for a 20-foot-deep and 100-foot-wide channel from a point 50 feet above the Tuxbury Lumber Co.'s plant to deep water in the lower river, with additional increases in width at bends (U. S. Army Corps of Engineers 1933:360). The act also authorized a 12-foot-deep and 100-foot-wide channel from the Gulf Refining Co.'s wharf to the Tuxbury Lumber Co.'s plant. This project was modified in 1935. This modification called for a 28-foot-deep and 120-foot-wide channel from deep water in the Cooper River to a point 100 feet above the Gulf Refining Co.'s terminal, with increased widths at bends (U. S. Army Corps of Engineers 1935:508). Also, a 20-foot-deep and 100-foot-wide channel was to be maintained from the Gulf Refining Co.'s terminal to a point 50 feet above the Tuxbury Lumber Co.'s wharf. This project was once again modified in the River and Harbor Act of 1937. The new proposed work called for a 30-foot-deep, 200-foot-wide channel up to the Gulf Oil Corporation's terminal with a turning basin 30 feet deep at the latter point (U. S. Army Corps of Engineers 1937:535). This project was completed in 1939.

The River and Harbor Act of 1945 called for an extension of the previous project's channel. The new work included an extension of the 30-foot channel to the Pittsburgh Metallurgical Co., with a 30-foot-deep turning basin at the upper end of the project (U. S. Army Corps of Engineers 1945:668). This extension was completed in 1951 with periodic maintenance dredging thereafter.

Wappoo Cut

Improvements to Wappoo Cut were initiated in the River and Harbor Act of 1881. This act recommended dredging at the bar to the entrance into the Ashley River, at one place within the cut, a cut-off through the marsh about 2 1/2 miles from the Ashley River, closing three small tidal branches, and building a short jetty at both the Stono and Ashley River ends (U. S. Army Corps of Engineers 1881:171). That project was revised in 1888. The new project called for securing a channel 6 feet deep and 60 feet wide at low mean water. It also provided for training walls at the Stono River entrance, revetting the banks of Elliot's Cut with stone, making another cut through the marsh, constructing three more closing dams and dredging the Ashley River bar to provide a channel 7 feet deep and 200 feet wide (U. S. Army Corps of Engineers 1889:156).

By the end of 1889 there was a continuous 6 foot depth through Wappoo Cut from the Stono to Ashley Rivers, and by 1893 all dredging was completed. Two closing dams were completed by 1892, while a third dam was determined no longer necessary because shoaling closed the proposed dam area. The revetment of Elliot's Cut was completed in 1895. Near the mouth of the Ashley River, however, shoaling remained a problem (U. S. Army Corps of Engineers 1920:690). Consequently, recommendations were made to conduct maintenance dredging at the mouth at the Ashley River, as well as repair the revetments at Elliot's Cut. In 1913, the Chief of Engineers recommended that, as part of the intracoastal waterway, a channel 7 feet deep and 100 feet wide be maintained through Wappoo Cut (U. S. Army Corps of Engineers 1919:712). This project was completed in conjunction with work approved for the Atlantic Intracoastal Waterway.

Folly River

The 1977 River and Harbor Act approved a 9-foot-deep, 80 foot-wide channel in Folly River and Folly Creek, and an 11 feet deep and 100 feet wide entrance channel at Stono Inlet. This project, which began in 1979, consisted of periodic maintenance dredging to maintain the current project dimensions.

St. Stephen Project, Cooper River

The River and Harbor Act of 1968 authorized a study to solve the shoaling problems within the Cooper River and Charleston Harbor. The study approved of diverting most of the Santee River waters from above Pinopolis Dam into the lower Santee River through a canal beginning at Lake Moultrie and extending to the Santee river in the vicinity of St. Stephen, South Carolina (U. S. Army Corps of Engineers 1969:277). The study was completed in 1970 and construction on a new canal and hydroelectric facility were initiated in 1977. The power plant came on-line in 1985 and all remaining construction activities were completed in 1991.

Sawmill Branch

The Saw Mill Branch is a tributary of the Ashley River. A project calling for the excavation of a channel of varying size, with a maximum width of 35 feet, to 15 feet up the Sawmill Branch from a point above its confluence with the Ashley River was approved in 1968 as part of the 1948 Flood control Act (U. S. Army Corps of Engineers 1971:7-7). The project extended through Summerville to a point nine miles from its beginning. All work was completed in April 1971.

Atlantic Intracoastal Waterway

Outside of the work conducted within the harbor and its adjacent vicinity very little specific work has been conducted along the Atlantic Intracoastal waterway within the current project limits. Much of the work was general in nature and comprised large sections of the waterway. The River and Harbor Act of 1902 called for improving the waterway between Charleston Harbor and McClellanville to a depth of 4 feet and a width of 60 feet (U. S. Army Corps of Engineers 1902:246). The act also called for improvements in the section of waterway between Charleston and Beaufort. That work involved improvements to various shoals within the waterway, among them Wappoo Cut. Details of that work has been discussed as a separate project in the Corps reports.

The River and Harbor Act of 1925 modified the existing project between Charleston and Beaufort. This act called for increasing the depth along this entire section of waterway to 7 feet below mean low water and a width of 75 feet (U. S. Army Corps of Engineers 1926:586). The Charleston to McClellanville section was modified in the 1935 River and Harbor Act, which called for increasing the waterway to 10 feet deep and 90 feet wide (U. S. Army Corps of Engineers 1936:480). Finally, the River and Harbor Act of 1937 provided for increasing the dimensions for the waterway between Winyah Bay to Beaufort to 12 feet deep and 90 feet wide (U. S. Army Corps of Engineers 1936:537). Between 1937 and 1993 work on the waterway within the project vicinity consisted of maintenance dredging to maintain the channel at a 12 foot depth and a 90 foot width.

Submerged Cultural Resource Assessment_____

Implications of Historic Research

An examination of the prehistoric archaeological record, as well as historic documentation, provides some insight into the potential nature and scope of cultural resources within the project area. For example, investigation of the prehistoric archaeological record at Coastal Zone sites in the project vicinity has generated sufficient data to confirm the nature of settlement patterns along the South Carolina coast from the Archaic through the Woodland II period. Although there is a possibility that portions of the prehistoric archaeological record may have survived the inundation process, the high energy coastal environment and relatively fragile nature of South Carolina Coastal Zone sites would appear to offer limited potential for research. Until inundated sites have been identified and investigated we can only speculate about the level of the surviving archaeological record.

Both the Paleo-Indian and Archaic lifestyles were highly mobile, generating minimal archaeological evidence. While lithic material associated with Paleo and Archaic populations would survive the inundation process, the more delicate archaeological evidence would probably be destroyed. While the lithic evidence could contribute to an understanding of the distribution of populations in South Carolina prehistory, site specific data would no doubt be limited. The greater population densities and sedentary lifestyles associated with the Woodland I and Woodland II inhabitants of the Coastal Zone produced a more extensive and complex archaeological record. Lithic, and to a lesser degree, ceramic artifacts would no doubt survive the inundation process and preserve indications of the distribution of Woodland I and Woodland II populations. In addition, some highly stratified sites encapsulated by sediment or shell middens prior to the inundation process could also contain a recoverable archaeological record. Unfortunately, subbottom evidence of these sites would be difficult to identify.

Historical evidence suggests that the submerged archaeological record in the survey area could also contain material associated with maritime activities. From the earliest times of European involvement in South Carolina the volume of river traffic was directly proportional to the prosperity of Charleston itself. This in turn was affected by the political and economic components of the nation in general. Simply stated, when Charleston prospered, commercial activities on the waterways increased appreciably.

Research has shown that throughout history a variety of vessels traveled the waters of the Ashely, Cooper, Wando and Stono Rivers, as well as the smaller creeks. Small inland and coasting vessels would have been common during the colonial and Revolutionary War periods. Unfortunately, specific geographical references to small vessel sinkings are rare. The types of small craft most commonly traveling the area's waterways were also the least likely vessels or shipwrecks to appear in the historical record. It is precisely this scarcity of information, however, that imbues such vessels with greater archaeological significance. Unfortunately, they are also the most difficult to locate as their remains produce a minimal magnetic and acoustic remote sensing signature.

Because of the high level of channel improvement and maintenance activities dating from the last quarter of the eighteenth century, traditional deep water channels serving the port appear to have only marginal potential for significant submerged cultural resources. Historical records confirm that dredging has been extensive since the third quarter of the nineteenth century and economic pressure to maintain obstruction free channels has supported salvage activity since the third quarter of the eighteenth century. Although the traditional navigation channels appear to have limited potential for submerged cultural resources, potential should be high in previously

undisturbed areas. In areas outside the historically maintained channel alignments, economic pressure to remove navigational obstructions would have been significantly reduced, and bottom disturbance activity minimal.

Implications of Cartographic Research

An examination of the cartographic resources confirmed that the Charleston Harbor area is part of a complex and highly sensitive historical environment. The Charleston Harbor basin was rich in colonial and post colonial settlements. Historical and cartographic research indicates that much of the region's river shorelines were marshland before the second quarter of the twentieth century. All of the consulted maps reveal that plantation buildings were located as close to a water source as possible, either on a river bank or on the edge of a marsh. In cases where plantations fronted marshland, causeways typically provided river access. In addition, plantations often maintained their own vessels for transporting goods and people to Charleston, thereby contributing to heavy shipping traffic along the waterways.

In addition, ferries served as an important link in the transportation and communication network of the Charleston area. Ferry landings were, therefore, a common feature on the Charleston area's landscape. An important ferry, for example, was located north of the city near Clouter Creek. The Dover-Calais Landings may have served to connect the Huguenot settlements along the east bank of the Cooper River with the English settlements and the city on the west bank. The establishment of Strawberry Ferry on the Western Branch of the Cooper River provided further access to the resources of the hinterland and resulted in the founding of the town of Childsbury.

Charleston developed as one of the major southern port cities. Because of the volume of vessel traffic, shoals at the harbor entrance represented a significant navigational hazard. Maps depicting the harbor's physiographic change through time reveal anywhere between two to six shifting channels entering the harbor. Shoaling was also a problem within the harbor proper. Many ships, sailing in the apparent safety of the harbor, fell victim to the treacherous shoals. The harbor's main channel passed south of Marsh Island, or Shutes Folly Island as it was later named. Marsh Island did not erode to its current configurations until the 1830s, and even then the area remained a hazardous shoal. Although the main channel continued south of Marsh Island, a new channel skirting the northern shore of Hog Island was cut by the river sometime around the Civil War. The main shipping channel was not shifted to its current position, north of Shutes Folly Island, until post-Civil War harbor improvements.